

APPENDIX A

**ARARs
FOR SILO 3 REMEDIAL ACTION**

TABLE A-1
ARARS FOR SILO 3 REMEDIAL ACTION
CHEMICAL-SPECIFIC

Medium	Clean Air Act (CAA)	Requirement	ARAR/TBC	Rationale for Implementation
Air	Radionuclide Emissions (Except Airborne Radon-222), 40 CFR Part 61 Subpart H.	Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that might cause any member of the public to receive, in any year, an effective dose equivalent (EDE) of 10 mrem or greater per year.	Applicable	Radioactive materials within Silo 3 could contribute to the dose received by members of the public from the air pathway during implementation of Silo 3 remedial actions.
Air	Radon-222 Emissions, 40 CFR Part 61 Subpart Q.	Monitoring is required at release points having potential to discharge radionuclides that could cause an EDE in excess of 1% of the standard (0.1 rem/yr) to any member of the public.	Applicable	A 'source' is defined by NESHAP Subpart Q as "any building, structure, pile, or impoundment used for interim storage or disposal that is or contains waste material containing radium in sufficient concentration to emit radon-222 in excess of this standard prior to remedial action." Temporary staging of Silo 3 material during the process of packaging and transportation to the disposal facility does not constitute a 'source' for the purposes of this standard. This standard is applicable to the facility used for disposal of the Silo 3 material.
Air		No source at a DOE facility shall emit more than 20 pCi/m ³ s of radon-222 as an average for the entire source during periods of storage and disposal.	Applicable	

TABLE A-1 (Continued)

Medium	DOE	Requirement	ARAR/TBC	Rationale for Implementation																																																																																				
Air	Radiation Protection of the Public and the Environment, Proposed 10 CFR Part 834.	<p>Residual concentrations of radionuclides in the air within uncontrolled areas are limited to those listed below (for known mixtures of radionuclides, the sum of the ratios of the observed concentration of each radionuclide to its corresponding limit must not exceed 1.0.).</p> <p>Derived Concentration Guide</p> <table> <thead> <tr> <th>Isotope</th> <th>($\mu\text{C}/\text{mL}$)</th> <th>D^a</th> <th>W</th> <th>Y</th> </tr> </thead> <tbody> <tr> <td>Actinium-227</td> <td>2×10^{-15}</td> <td>7×10^{-15}</td> <td>1×10^{-14}</td> <td></td> </tr> <tr> <td>Lead-210</td> <td>9×10^{-13}</td> <td>-----^b</td> <td></td> <td></td> </tr> <tr> <td>Polonium-210</td> <td>1×10^{-12}</td> <td>1×10^{-12}</td> <td>-----</td> <td></td> </tr> <tr> <td>Protactinium-231</td> <td>-----</td> <td>9×10^{-15}</td> <td>1×10^{-14}</td> <td></td> </tr> <tr> <td>Radium-224</td> <td>-----</td> <td>4×10^{-12}</td> <td>-----</td> <td></td> </tr> <tr> <td>Radium-226</td> <td>-----</td> <td>1×10^{-12}</td> <td>-----</td> <td></td> </tr> <tr> <td>Radium-228</td> <td>-----</td> <td>3×10^{-12}</td> <td>-----</td> <td></td> </tr> <tr> <td>Technetium-99</td> <td>1×10^{-8}</td> <td>2×10^{-9}</td> <td>-----</td> <td></td> </tr> <tr> <td>Strontium-90^c</td> <td>5×10^{-11}</td> <td>-----</td> <td>9×10^{-12}</td> <td></td> </tr> <tr> <td>Thorium-228</td> <td>-----</td> <td>5×10^{-14}</td> <td>4×10^{-14}</td> <td></td> </tr> <tr> <td>Thorium-230</td> <td>-----</td> <td>4×10^{-14}</td> <td>5×10^{-14}</td> <td></td> </tr> <tr> <td>Thorium-232</td> <td>-----</td> <td>7×10^{-15}</td> <td>1×10^{-14}</td> <td></td> </tr> <tr> <td>Uranium-234</td> <td>4×10^{-12}</td> <td>2×10^{-12}</td> <td>9×10^{-14}</td> <td></td> </tr> <tr> <td>Uranium-235</td> <td>5×10^{-12}</td> <td>2×10^{-12}</td> <td>1×10^{-13}</td> <td></td> </tr> <tr> <td>Uranium-236</td> <td>5×10^{-12}</td> <td>2×10^{-12}</td> <td>1×10^{-13}</td> <td></td> </tr> <tr> <td>Uranium-238</td> <td>5×10^{-12}</td> <td>2×10^{-12}</td> <td>1×10^{-14}</td> <td></td> </tr> </tbody> </table>	Isotope	($\mu\text{C}/\text{mL}$)	D ^a	W	Y	Actinium-227	2×10^{-15}	7×10^{-15}	1×10^{-14}		Lead-210	9×10^{-13}	----- ^b			Polonium-210	1×10^{-12}	1×10^{-12}	-----		Protactinium-231	-----	9×10^{-15}	1×10^{-14}		Radium-224	-----	4×10^{-12}	-----		Radium-226	-----	1×10^{-12}	-----		Radium-228	-----	3×10^{-12}	-----		Technetium-99	1×10^{-8}	2×10^{-9}	-----		Strontium-90 ^c	5×10^{-11}	-----	9×10^{-12}		Thorium-228	-----	5×10^{-14}	4×10^{-14}		Thorium-230	-----	4×10^{-14}	5×10^{-14}		Thorium-232	-----	7×10^{-15}	1×10^{-14}		Uranium-234	4×10^{-12}	2×10^{-12}	9×10^{-14}		Uranium-235	5×10^{-12}	2×10^{-12}	1×10^{-13}		Uranium-236	5×10^{-12}	2×10^{-12}	1×10^{-13}		Uranium-238	5×10^{-12}	2×10^{-12}	1×10^{-14}		<p>To be considered</p> <p>Remediation of the Silo 3 material has the potential to release radionuclides.</p>
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^a D, W, and Y (days, weeks, years) represent lung retention classes; removal halftimes assigned to the compounds with classes D, W, and Y are 0.5, 50, and 500 days, respectively. Exposure conditions assume an inhalation rate of 8,400 m³ of air per year (based on an exposure over 24 hours per day, 365 days/year).

^b A dashed line means that no limit has been established.

^c The value shown for daily derived concentration guide (DCG) is for strontium radionuclides with a f_i value of 3×10^{-1} . The value shown for yearly DCG is for strontium radionuclides for a f_i value of 1×10^{-2} .

TABLE A-1 (Continued)

Medium	DOE (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Air	Residual Radioactive Material, DOE Order 5400.5 Chap. IV, 6.b (proposed 10 CFR Part 834).	Interim Storage The above-background concentration of radon-222 in air above an interim storage facility must not exceed: 100 pCi/L at any point, an annual average of 30 pCi/L over the facility, or an annual average of 0.5 pCi/L above background or above any location outside the site.	To be considered	Management of radium and thorium bearing waste might result in the release of radon gas to the environment.
Water	Radiation Protection of the Public and the Environment, Proposed 10 CFR Part 834.	Residual concentrations of radionuclides in water that may be ingested are listed below. These DCGs for the COCs are based on a committed EDE of 100 mrem/yr, assuming ingestion of 2 liters/day. Note that these DCGs apply only if ingestion is the single pathway of exposure.	To be considered	Remediation of the Silo 3 material has the potential to release radionuclides.

Ingested Water DCGs
[$\mu\text{Ci/mL}$]

Actinium-227	1×10^{-8}
Lead-210	3×10^{-8}
Polonium-210	8×10^{-8}
Protactinium-231	1×10^{-8}
Radium-224	4×10^{-7}
Radium-226	1×10^{-7}
Radium-228	1×10^{-7}
Technetium-99	1×10^{-4}
Stron튬-90	1×10^{-6}
Thorium-228	4×10^{-7}
Thorium-230	3×10^{-7}
Thorium-232	5×10^{-8}
Uranium-234	5×10^{-7}
Uranium-235	6×10^{-7}
Uranium-236	5×10^{-7}
Uranium-238	6×10^{-7}

TABLE A-1 (Continued)

Medium	CWA	Requirement	ARAR/TBC	Rationale for Implementation
Water	Ohio Water Quality Standards, Ohio Administrative Code (OAC) 3745-1-04.	"Five Freedoms" for surface water: Surface waters of the state shall be free from: <ul style="list-style-type: none"> • objectionable suspended solids; • floating debris, oil and scum; • materials that create a nuisance; • toxic, harmful or lethal substances; and • nutrients that create nuisance growth. 	Relevant and Appropriate	Pertains to discharges to surface waters as a result of remediation and to on-site surface waters affected by site conditions.
Water	Ohio Water Quality Standards, OAC 3745-1-07.	Use Designations and Criteria All pollutants or combinations of pollutants shall not exceed, outside the mixing zone, the Numerical and Narrative Criteria for Aquatic Life Habitat and Water Supply Use Designations listed in Tables 7-1 through 7-15 of this rule. The following constituents of concern (COCs) for Operable Unit 4 have warm water habitat criteria concentrations outside the mixing zone as follows:	Relevant and Appropriate	Pertains to discharges to surface waters as a result of remediation and to on-site surface waters affected by site conditions.

30-day Criteria Constituent	average conc. ^a ($\mu\text{g/l}$)	conc. ($\mu\text{g/l}$)
antimony	650	190
arsenic	360	190
beryllium	Tab. 7-10 ^b	Tab. 7-11 ^c
cadmium	Tab. 7-10	Tab. 7-11
chromium	Tab. 7-10	Tab. 7-11
copper	Tab. 7-10	Tab. 7-11
cyanide	46	12
lead	Tab. 7-10	Tab. 7-11
mercury	1.1	0.20
nickel	Tab. 7-10	Tab. 7-11
selenium	20	5.0
silver	Tab. 7-10	1.3
thallium	71	16

TABLE A-1 (Continued)

Water	Ohio Water Quality Standards, OAC 3745-1-07 (continued).	30-day Criteria Constituent	average conc. ^a (ug/l)	conc. (ug/l)
		zinc	Tab. 7-10 Tab. 7-11 average conc. ^a (ug/l)	conc. (ug/l)
		30-day Criteria Constituent		
		2-butanolone160000	790	35
		4-nitrophenol	550000	78000
		acetone	---	0.01
		aldrin		
		bis(2-ethylhexyl) phthalate1100		
		carbon tetrachloride1800	8.4	280
		DDT	---	0.0001
		Dieldrin	---	0.0005
		di-n-butyl-phthalate350	190	120
		diethylphthalate	2600	73
		dimethylphthalate	1700	0.0003
		endosulfan ^d	---	0.0002
		endrin	---	8.9
		fluoranthene	200	430
		methylene chloride	9700	0.001
		PCBs	---	370
		phenol	5300	73
		tetrachloroethene	540	1700
		toluene	2400	

^a Criteria concentration shall be met outside mixing zone.

^b Criteria concentration based on hardness of water. See Table 7-10 for calculation to determine maximum concentration outside the mixing zone.

^c 30-day average criteria based on hardness of water. See Table 7-11 for calculation to determine allowable 30-day average concentration outside the mixing zone.

^d No designation was made as to whether endosulfan referred to endosulfan I or endosulfan II or the sum total of each.

The remaining COCs for OU4 will have criteria concentration levels based on calculated acute aquatic criteria or chronic aquatic criteria.

TABLE A-2
ARARS FOR SILO 3
REMEDIAL ACTION, LOCATION-SPECIFIC

NEPA/EPA	Requirement	ARAR/TBC	Rationale for Implementation
Endangered Species Protection, 50 CFR Part 402 (ORC 1518, 1513.25 and OAC 1501-18-1-01).	Federal agencies must not jeopardize the continued existence of any endangered or threatened species, or destroy or adversely modify critical habitat of such species.	Applicable	The FEMP is located within the range of the Indiana bat, a federally listed endangered species, which has been sighted at the FEMP. Therefore, this requirement is applicable. Any potential impacts of the remedial actions on this species must be evaluated and appropriate action taken.
NEPA/DOE	Requirement	ARAR/TBC	Rationale for Implementation
Compliance with Floodplain/Wetlands Environmental Review Requirements, 10 CFR Part 1022 (Executive Order 11990).	DOE actions in a wetland must first evaluate the potential adverse effects that those actions might have on the wetland and consider the natural and beneficial values served by the wetlands.	Applicable	This requirement is applicable because the FEMP is a DOE facility. Several alternatives might result in destruction or modification of wetland areas.

TABLE A-3
ARARS FOR SILO 3
REMEDIAl, ACTION-SPECIFIC

AEA/DOE	Requirement	ARAR/TBC	Rationale for Implementation
10 CFR Part 1021.2	DOE actions must be subjected to NEPA evaluation as outlined by the Council on Environmental Quality regulations in 40 CFR Part 1500-1508.	Applicable	This requirement is applicable because the FEMP is a DOE facility, and this requirement requires NEPA evaluation for specific actions at DOE facilities.
CWA	Requirement	ARAR/TBC	Rationale for Implementation
Nationwide Permit Program, 33 CFR Part 330.	The U.S. Corps of Engineers can issue a Nationwide Permit (NWP) as a general permit for certain classes of actions that involve dredge or fill activities in wetlands or navigable waters. Discharges of dredged or fill material into wetlands may require a wetland delineation.	Applicable	Remediation activities may require construction of access roads and utility lines resulting in minor wetland disturbances. Dredge and fill activities related to construction of these access roads and utility lines will be conducted in accordance with the substantive terms and conditions of NWP 14 (Road Crossing), and NWP 12 (Utility Line Backfill and Bedding). OEPA has been granted Section 401 State Water Quality Certification for NWPs 12 and 14.
Discharge of Stormwater Runoff, 40 CFR Part 122.26 (OAC 3745-38).	Stormwater runoff from landfills, construction sites, and industrial activities must be monitored and controlled. A Stormwater Pollution Prevention Plan is required for construction activities that result in a total land disturbance of five or more acres.	Applicable	Required of industrial waste sites and construction sites of greater than five acres that discharge stormwater runoff to the waters of the U.S. Some remedial alternatives evaluated might disturb more than five acres of land.

TABLE A-3 (Continued)

CWA (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Discharge of Treatment System Effluent, 40 CFR Part 125.100. 40 CFR Part 125.104.	<p>Best Management Practices (BMPs) Development and implementation of a BMP program to prevent the release of toxic or hazardous pollutants to waters of the U.S. Development and implementation of a sitewide BMP Program is also required as a condition of the FEMP National Pollution Discharge Elimination System (NPDES) Permit.</p> <p>The BMP program must:</p> <ul style="list-style-type: none"> • Establish specific objectives for the control of toxic and hazardous pollutants, and • Include a prediction of direction, rate of flow, and total quantity of toxic and hazardous pollutants where experience indicates a reasonable potential for equipment failure. 	Relevant and Appropriate	All of the proposed actions have the potential for releases and runoff from this operable unit (OU).
Safe Drinking Water Act (SDWA)	Requirement	ARAR/TBC	Rationale for Implementation
Ohio Water Well Standards, OAC 3745-9-10.	Abandonment of Test Holes and Wells Upon completion of testing, a test hole or well shall be either completely filled with grout or such material as will prevent contaminants from entering groundwater.	Applicable	Test borings and wells might be installed and/or closed as part of these remedial alternatives.

TABLE A-3 (Continued)

UMTRCA	Requirement	ARAR/TBC	Rationale for Implementation
Implementation of Health and Environmental Protection Standards for Uranium Mill Tailings, 40 CFR Part 192 Subpart C.	This subpart contains guidance, criteria, and supplemental standards for compliance with Subparts A and B of 40 CFR Part 192.	Relevant and Appropriate	Radioactive materials in this OU are primarily by-product residues from uranium processing. Requirements for design of controls should be consistent with design of controls for other residual radioactive materials such as mill tailings.
RCRA Subtitle C	Requirement	ARAR/TBC	Rationale for Implementation
Hazardous Waste Determinations, 40 CFR Part 262.11 (OAC 3745-52-11).	<p>Any generator of waste must determine whether or not the waste is hazardous.</p> <p>The procedures for determination include:</p> <ul style="list-style-type: none"> • Identification of whether a particular material of concern is a "solid waste"; • Identification of whether a particular exclusion applies to the material eliminating it from definition as a "solid waste"; • Identification of whether a particular solid waste might be classified as a hazardous waste; and • Determination of whether a material otherwise classified as a "hazardous waste" might be excluded from RCRA regulation. 	<p>Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes (e.g., secondary waste) that exhibit a hazardous characteristic.)</p>	<p>These procedures are established to determine whether wastes are subject to the requirements of RCRA. The materials in Silo 3 are specifically exempt from the applicability of RCRA requirements. However, certain specific RCRA requirements, as identified in the remainder of this table, have been identified as relevant and appropriate to the onsite management (storage, transportation) of Silo 3 material.</p>
Hazardous Waste Exclusions, 40 CFR Part 261.4(a)(4) and 40 CFR 261(b)(7) (OAC 3745-51-4)	<p>Materials which are not solid waste include:</p> <ul style="list-style-type: none"> • Source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954 as amended <p>Solid wastes which are not hazardous wastes include:</p> <ul style="list-style-type: none"> • Solid waste from the extraction, beneficiation and processing of ores and minerals. 	Applicable	<p>The materials in Silo 3 were generated from the extraction/beneficiation of uranium from its ore and have been classified as by-product consistent with Section 11(e)2 of the AEA.</p>

TABLE A-3 (Continued)

RCRA Subtitle C	Requirement	ARAR/TBC	Rationale for Implementation
Empty Containers, 40 CFR Part 261.7 (OAC 3745-51-7).	<p>Containers that have held hazardous wastes are "empty" and exempt from further RCRA regulations if one or more of the following are met:</p> <ul style="list-style-type: none"> • No more than 2.5 cm (1 inch) of residue remains on the bottom of their inner liner; • Less than 3% by weight of total capacity remains (less than or equal to 110 gallon container); and • Less than 0.3% by weight of total capacity remains (greater than 110 gallon container). <p>Containers that have held acutely hazardous ("P" listed) wastes are "empty" and exempt from further RCRA regulation if:</p> <ul style="list-style-type: none"> • They or their inner liners have been triple rinsed with an adequate solvent or the inner liner has been removed from the container. 	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	Containers used to treat or store secondary waste generated consequential to implementing remedial actions to address the silo 3 residues may exhibit hazardous waste characteristics which must be removed before the containers might be reused or disposed.
Generators Who Transport Hazardous Waste for Off-site Treatment, Storage, or Disposal: 40 CFR Parts 262.20 - 33 and 263.20 - 31 (OAC 3745-52-20 through 33 and OAC 3745-53-20 through 31).	Any generator who transports hazardous waste for off-site treatment, storage or disposal must originate and follow-up the manifest for off-site shipments.	Applicable	Any secondary wastes generated consequential to the implementation of remedial actions to address the silo 3 residues which are determined to be RCRA hazardous waste would be subject to the manifest requirements to facilitate offsite treatment or disposal.

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Treatment, Storage, or Disposal Facility Standards; 40 CFR Part 264 Subpart B (OAC 3745-54-13 through 16).	<p><u>General Standards</u></p> <ul style="list-style-type: none"> • Waste Analysis - OAC 3745-54-13: Operators of a facility must obtain a detailed chemical and physical analysis of a representative sample of each hazardous waste to be treated, stored, or disposed of at the facility prior to treatment, storage, or disposal. • Security - OAC 3745-54-14: Operators of a facility must prevent the unknowning or unauthorized entry of persons or livestock into the active portions of the facility, maintain a 24-hour surveillance system, or surround the facility with a controlled access barrier and maintain appropriate warning signs at facility approaches. • Inspections - OAC 3745-54-15: Operators of a facility must: (1) develop a schedule and regularly inspect monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that are important to preventing, detecting or responding to environmental or human health hazards; (2) promptly or immediately remedy defects; and (3) maintain an inspection log. • Training - OAC 3745-54-16: Operators must train personnel, within six months of their assumption of duties at a facility, in hazardous waste management procedures relevant to their positions, including emergency response training. 	<p>Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)</p>	<p>Secondary wastes generated during the implementation of remedial actions to address the silo 3 residues might be required to be treated, stored, and disposed in accordance with TSD facility standards.</p>

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Treatment, Storage, or Disposal Facility Preparedness and Prevention; 40 CFR Part 264 Subpart C and 40 CFR Part 264.31 (OAC 3745-54-31).	Treatment, storage, and disposal facility (TSDF) operators must design, construct, maintain and operate facilities to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste to air, soil, or surface water which might threaten human health or the environment.	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	Secondary wastes generated during the implementation of remedial actions to address Silo 3 might be required to be treated, stored, and disposed in accordance with TSD facility standards.
40 CFR Part 264.32 (OAC 3745-54-32).	Facilities must be equipped with an internal communication or alarm system, a telephone, or a two-way radio for calling outside to emergency assistance, fire control, and spill control. Decontamination equipment and water must be at an adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems.		
40 CFR Part 264.33 (OAC 3745-54-33).	Fire protection, spill-control and decontamination equipment, and communication and alarm systems must be tested and maintained, as necessary, to ensure proper emergency operation.		
40 CFR Part 264.34 (OAC 3745-54-34).	Personnel must have immediate access to emergency communication or alarm systems whenever hazardous waste is being handled at the facility.		
40 CFR Part 264.35 (OAC 3745-54-35).	Aisle space must be sufficient to allow unobstructed movement of personnel, fire and spill control, and decontamination equipment.		
40 CFR Part 264.37 (OAC 3745-54-37).	Operators must attempt to make arrangements, appropriate to the waste handled, for emergency response by local and state fire, police and medical personnel.		

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Treatment, Storage, or Disposal Facility Contingency Plan and Emergency Procedures; 40 CFR Part 264 Subpart D and 40 Part CFR 264.51 (OAC 3745-54-51).	<p>Each facility operator must have a contingency plan designed to minimize hazards to human health or the environment due to fires, explosions, or any unplanned releases of hazardous waste constituents to the air, soil, or surface groundwater.</p> <p>40 CFR Part 264.52 (OAC 3745-54-52).</p> <p>Contingency plans should address procedures to implement a response to incidents involving hazardous waste, and provide for: internal and external communications, arrangements with local emergency authorities, an emergency coordinator list, a facility emergency equipment list indicating equipment descriptions and locations, and a facility personnel evacuation plan.</p> <p>40 CFR Part 264.55, .56 (OAC 3745-54-55 through 56).</p>	<p>Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)</p>	<p>Secondary wastes generated during the implementation of remedial actions to address Silo 3 might be required to be treated, stored, and disposed in accordance with TSD facility standards.</p>

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Closure, 40 CFR Part 264 Subpart G. 40 CFR Part 264.111 (OAC 3745-55-11). 40 CFR Part 264.114 (OAC 3745-55-14). 40 CFR Part 264.116 (OAC 3745-55-16).	An operator must close facilities in a manner that: <ul style="list-style-type: none"> • Minimizes the need for further maintenance; • Minimizes post-closure escape of hazardous constituents; and • Complies with specific, unit-type closure requirements. Contaminated equipment, structures and soils must be properly disposed or decontaminated. Following closure, a survey plot showing the location of hazardous waste disposal units, with respect to surveyed benchmarks, must be filed with the legal total zoning authority.	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	Secondary wastes generated during the implementation of remedial actions to address Silo 3 might be required to be treated, stored, and disposed in accordance with 1SD facility standards.

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Container Storage, 40 CFR Part 264 Subpart I 40 CFR Part 264.171 - 178 (OAC 3745-55-71 through -78).	<p>Containers of RCRA hazardous waste must be:</p> <ul style="list-style-type: none"> • Maintained in good condition; • Compatible with hazardous waste to be stored; • Closed during storage (except to add or remove waste); and • Managed in a manner that will not cause the container to rupture or leak. <p>Storage areas must be inspected weekly for leaking and deteriorated containers and containment systems.</p> <p>Containers must be placed on a sloped, crack-free base, and protected from contact with accumulated liquid. A containment system with a capacity of 10 percent of the volume of the largest container of free liquids must be provided. Spilled or leaked waste must be removed in a timely manner to prevent overflow of the containment system.</p> <p>Incompatible materials must be separated. Incompatible materials stored near each other must be separated by a dike or other barrier.</p> <p>At closure, hazardous waste and residue from the containment system must be removed, and containers, liners, bases, and soils must be removed or decontaminated.</p>	<p>Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)</p>	<p>Secondary wastes generated during the implementation of remedial actions to address Silo 3 might be required to be treated, stored, and disposed in accordance with TSD facility standards.</p>

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Tank Systems, 40 CFR Part 264 Subpart J (OAC 3745-55-91 through 96).	<p>Design, operating standards, and inspection requirements for tank units within which hazardous waste is stored or treated. Includes the following:</p> <ul style="list-style-type: none"> • Tank design must be compatible with the material being stored. • Tank must be designed and have sufficient strength to store or treat waste in order to ensure that it will not rupture or collapse. • Tank must have secondary containment that is capable of detecting and collecting releases to prevent migration of wastes or accumulated liquids to the environment. 	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	Design criteria, operating standards, and inspections for tank treatment units might be relevant and appropriate for alternatives utilizing treatment or storage in a tank prior to disposal.
Closure Requirements for Tanks, 40 CFR Part 264.197 (OAC 3745-55-97).	<p>At closure, the facility owner must do the following:</p> <ul style="list-style-type: none"> • Remove waste residues; • Remove or decontaminate tank system components; • Remove or decontaminate contaminated soils and structures; • Manage all of the above as hazardous wastes; and • If all contaminated soils cannot be removed, meet the landfill requirements of 40 CFR Part 264.310 	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	These standards will pertain to closure of any tanks and appurtenances used to provide treatment or storage of non-excluded wastes associated with the implementation of remedial actions for silo 3.

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Miscellaneous Units, 40 CFR Part 264 Subpart X (40 CFR 264.601,.602 and OAC 3745-57-91 and 92).	Environmental performance standard, monitoring, inspection, and post-closure care for treatment in miscellaneous units as defined in 40 CFR Part 260.10.	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	Miscellaneous units might be utilized under various alternatives to remediate waste that is sufficiently similar to hazardous wastes.
Corrective Action for Solid Waste Management Units (SWMUs), 40 CFR Part 264 Subpart S and 40 CFR Part 264.552,.553.	Corrective action management units (CAMUs) might be designated at the site as areas where remediation wastes (solid, hazardous, or contaminated media and debris) might be placed during the process of remediation. Temporary units consisting of tanks and container storage units might be used to store and treat hazardous waste during the process of corrective action.	Relevant and Appropriate (This requirement will be applicable to non-excluded solid wastes that exhibit a hazardous characteristic.)	During the process of remediation, waste materials might require temporary management in containment buildings, temporary units, stockpiles, or other land based units for the purpose of staging, treating or disposing the material. Materials generated from remediation of the Silo 3 material are considered remediation wastes. Some of the waste material might exhibit a RCRA characteristic, or otherwise be sufficiently similar to hazardous waste to make this requirement relevant and appropriate.

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Containment Buildings, 40 CFR Part 264 Subpart DD and 40 CFR Part 264.1101, .1102.	<p>Hazardous waste and debris might be placed into units known as containment buildings for the purpose of interim storage or treatment.</p> <p>Containment buildings must be fully enclosed to prevent exposure to the elements and ensure containment of managed wastes. Floor and containment walls must be designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit. Surfaces coming in contact with hazardous waste must be chemically compatible with waste. Primary barriers must be constructed to prevent migration of hazardous constituents into barrier. Secondary containment systems including secondary barriers and leak detection systems must also be constructed for containment buildings used to manage wastes containing free liquids.</p> <p>Controls must be implemented to ensure: the primary barrier is free of significant cracks, corrosion, or other deterioration that may allow release of hazardous waste; the level of hazardous waste does not exceed height of containment walls and is otherwise maintained within containment walls; tracking of waste out of unit by personnel or equipment used in handling waste is prevented; and fugitive dust emissions are controlled at the level of no visible emissions.</p>		<p>During the process of remediation, waste materials might require temporary management for the purpose of staging or treating the material. Some of the waste material might exhibit a RCRA characteristic, or otherwise be sufficiently similar to hazardous waste to make this requirement relevant and appropriate.</p>

TABLE A-3 (Continued)

RCRA Subtitle C (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Radiation Dose Limit (All Pathways), Proposed 10 CFR Part 834.	The exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an EDE greater than 100 mrem from all exposure pathways.	To be considered	Radiation sources from this OU (i.e., a DOE-owned facility) might contribute to the total dosage to members of the public.
CAA	Requirement	ARAR/TBC	Rationale for Implementation
Control of Fugitive Dust, OAC 3745-17-08.	Visible emissions of fugitive dust generated during grading, loading, or construction operations and other practices that emit fugitive dust shall be minimized or eliminated.	Relevant and Appropriate	The implementation of remedial action alternatives will require the movement of dirt and other material likely to result in fugitive dust emissions. This requirement is relevant and appropriate because the FEMP is not located in an area subject to this regulation.
Prevention of Air Pollution Nuisance, ORC 3704.01-05 and OAC 3745-15-07.	Measures shall be taken to adopt and maintain a program for the prevention, control, and abatement of air pollution in order to protect and enhance the quality of the state's air resource so as to promote the public health, welfare, and economic vitality of the people of the state. The emission or escape into open air from any source whatsoever of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, and combinations of the above in such a manner or in such amounts as to endanger the health, safety, or welfare of the public or to cause unreasonable injury or damage to property shall be declared a public nuisance and is prohibited.	Applicable	During the remediation process, some potential exists for emissions of radionuclides and toxic chemicals to the air..

TABLE A-3 (Continued)

CAA (continued)	Requirement	ARAR/TBC	Rationale for Implementation
Control of Visible Particulate Emissions from Stationary Sources, OAC 3745-17-07.	Discharge of particulate emissions of a shade or density greater than 20 percent opacity into ambient air from any stack is prohibited. Transient limits are included in this regulation.	Applicable	Treatment operations for various alternatives might result in the release of particulate material.
Permit to Install, OAC 3745-31-05(A)(3).	The director shall issue a permit to install if he/she determines that the installation or modification and operation of the air contaminant source will employ the best available technology.	Relevant and Appropriate	Although an administrative permit to install is not required for alternatives involving treatment, the substantive requirements of this section must be met by employing Best Available Technology (BAT) for treating particulate and other off-gas emissions.

TABLE A-3 (Continued)

CAA (continued)	Requirement	ARAR/TBC	Rationale for Implementation														
Restrictions on Particulate Emissions from Industrial Processes, OAC 3745-17-11.	<p>This requirement establishes numerical emission release limits for particulate material from industrial sources.</p> <p>Any source (operation, process, or activity) shall be operated so that particulate emissions do not exceed allowable emission rates specified in this regulation [based on processing weights (Table I) or uncontrolled mass rate of emissions (Figure II) of OAC 3745-17-11].</p> <p>A source complies with Table I requirements if its rate of particulate emission is always equal to or less than the allowable rate of particulate emission based on the maximum capacity of the source:</p> <table> <thead> <tr> <th>Process Rate at Maximum Capacity (lb/hr)</th> <th>Allowable Rate of Particulate Emission (lb/hr)¹</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>0.551</td> </tr> <tr> <td>200</td> <td>0.877</td> </tr> <tr> <td>400</td> <td>1.40</td> </tr> <tr> <td>600</td> <td>1.83</td> </tr> <tr> <td>800</td> <td>2.22</td> </tr> <tr> <td>1000</td> <td>2.58</td> </tr> </tbody> </table> <p>¹ Excerpted from Table I of OAC 3745-17-11.</p>	Process Rate at Maximum Capacity (lb/hr)	Allowable Rate of Particulate Emission (lb/hr) ¹	100	0.551	200	0.877	400	1.40	600	1.83	800	2.22	1000	2.58	Applicable	Treatment operations for various alternatives might result in release of particulate material that might exceed these standards.
Process Rate at Maximum Capacity (lb/hr)	Allowable Rate of Particulate Emission (lb/hr) ¹																
100	0.551																
200	0.877																
400	1.40																
600	1.83																
800	2.22																
1000	2.58																

TABLE A-4
OTHER REQUIREMENTS FOR SILO 3
REMEDIAL ACTION ALTERNATIVES

Title	Requirement	Rationale for Implementation
OSHA Worker Protection Requirements, 29 CFR Parts 1904 and 1910.	Establishes requirements to protect workers who could be exposed to radiation, noise, hazardous wastes, or other contaminants or hazards at the remediation site.	This OU is a remediation site under CERCLA. Compliance with 29 CFR Part 1910.120 is required for sites undergoing remediation by 40 CFR Part 300.150.
DOT Requirements for Transportation of Hazardous Materials, 49 CFR Parts 171-173, 177, 178.	<p>Hazardous materials may not be transported on public highways except in accordance with these regulations:</p> <ul style="list-style-type: none"> • Part 171, General Requirements. • Part 172, this part establishes shipping papers, marking, labeling, placarding, and emergency response information requirements. • Part 173, this part establishes packaging and other shipping requirements for hazardous materials, including radioactive materials. • Part 177, Requirements of the Transporter. • Part 178, Specifications for Shipping Containers. 	<p>Applicable to those alternatives which involve transportation of the waste materials off-site. Radioactive materials and materials sufficiently similar to hazardous wastes might be shipped off-site.</p>
Highway Improvement Act of 1982, 23 USC 127.	Establishes vehicle weight limits for interstate highways.	<p>Applicable to those alternatives which involve transportation of the waste materials off-site.</p>
Hazardous Materials Transportation Act, 49 USC 1801-1812.	Establishes requirements for minimizing environmental impacts of spills or releases of hazardous materials.	<p>Applicable to those alternatives which involve transportation of the waste materials off-site. Radioactive materials and materials sufficiently similar to hazardous wastes might be shipped off-site.</p>

TABLE A-4 (Continued)

Title	Requirement	Rationale for Implementation
NTS Waste Acceptance Criteria.	Establishes which wastes may be disposed at the Nevada Test Site.	The NTS waste acceptance criteria would be applicable to disposals at the NTS. NTS operates under DOE Order 435.1, "Radioactive Waste Management."
National Historic Preservation Act, 16 USC 470 et seq.	Protects sites listed or eligible for listing in the National Register of Historic Places.	Required by law for the alternatives affected.
Archaeological and Historic Preservation Act, 16 USC 469.	Preserves artifacts and data associated with archaeological finds.	Required by law for the alternatives affected.
American Indian Religious Freedom Act, 42 USC 1996.	Provides for tribal access by native peoples to grave sites and sites of cultural, symbolic, or religious significance.	Required by law for the alternatives affected.
Native American Graves Protection and Repatriation Act, 25 USC 3001.	Provides for return of human remains and cultural objects from Native American graves to affiliated tribes.	Required by law for the alternatives affected.
Protection and Enhancement of Cultural Environment, Executive Order 11593.	Requires inventory of site for potential historic places for eligibility in the National Register of Historic Places.	Required by law for the alternatives affected.
Fish and Wildlife Coordination Act, 16 USC 66 et seq	Requires consultation with other state agencies on activities that might affect any body of water for the conservation of fish and wildlife resources.	Required by law for the alternatives affected.

TABLE A-4 (Continued)

Title	Requirement	Rationale for Implementation
Archaeological Resources Protection Act, 16 USC 470 (a).	Requires permit for removal of any archaeological resources from federal lands.	Required by law for the alternatives affected.
Antiquities Act and Historic Sites Act, 16 USC 431-433 and 16 USC 461-467.	Requires identification and preservation of cultural resources on federal lands; includes natural landmarks.	Required by law for the alternatives affected.
Farmland Protection Policy Act, 7 USC 4201 et. Seq.	Requires protection and maintenance of farmland for its beneficial use as a national resource.	Required by law for the alternatives affected.
Occupational Radiation Protection, 10 CFR Part 835.	Provides standards for occupational radiation protection of workers at DOE facilities.	Required by law for safety and worker protection at DOE facilities (replaces former DOE Order 5480.11).
DOE Order	Title	Rationale for Implementation
5400.3	Hazardous and Mixed Waste Program	Contractual obligation for activities at DOE facilities.
5400.5	Radiation Protection of the Public and the Environment	Contractual obligation for activities at DOE facilities.
451.1A	NEPA Compliance Program	Contractual obligation for activities at DOE facilities.
5480.1B	Environmental, Safety, and Health Program for DOE Operations	Contractual obligation for activities at DOE facilities.
460.1A	Packaging and Transportation Safety	Contractual obligation for activities at DOE facilities.
460.2	Departmental Materials Transportation and Packaging Management	Contractual obligation for activities at DOE facilities.

TABLE A-4 (Continued)

DOE Order	Title	Rationale for Implementation
5480.4	Environmental Protection, Safety, and Health Protection Standards	Contractual obligation for activities at DOE facilities.
440.1A	Worker Protection for DOE Federal and Contractor Employees	Contractual obligation for activities at DOE facilities.
435.1	Radioactive Waste Management	Contractual obligation for activities at DOE facilities.
414.1	Quality Assurance	Contractual obligation for activities at DOE facilities.
430.1A	Life Cycle Asset Management	Contractual obligation for activities at DOE facilities.